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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,063	11/07/2001	Chung-Hee Chang	50103-404	4803

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EXAMINER

FALASCO, LOUIS V

ART UNIT

PAPER NUMBER

1773

DATE MAILED: 03/03/2003

4

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/986,063

Applicant(s)

CHANG ET AL.

Examiner

Louis Falasco

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 14-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**Claims**

Claims are 1 to 20.

**Papers Received**

Information Disclosure Statement has been received.

**Restriction**

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

Group I. Claims 1 to 13, 19 and 20, drawn to magnetic recording medium,  
classified in class 428, subclass 694R.

Group II. Claims 14 to 18, drawn to a method of coating, classified in class  
427, subclass 457.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions of Group II and Group I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product of Group I can be made by another and materially different process such as by lamination.

3. During a telephone conversation with Aaron Weisstuch, Ph.D. on February 11, 2003 a provisional election was made with out traverse to prosecute the invention of

Group I, claims 1 to 13, 19 and 20. Affirmation of this election must be made by applicant in replying to this Office action.

4. Claims 14 to 18 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

### DETAILED ACTION ON MERITS

#### Claims:

Claims under consideration are claims 1 to 13, 19 and 20.

#### Objection:

5. The disclosure is objected to because of the following informalities: The Provisional priority application is has been incorporated by reference – yet a copy has not been and it has not been published nor available to the public, further is not maintained for public use by the USPTO.

Appropriate correction is required.

#### Rejections:

#### Statutory Basis

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

### Rejections

6. Claims 1 to 13, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted state of the prior art taken with **Honda et al** (US 5851643) in view of **Futamato et al** (US 6403203).

Admittedly, perpendicular magnetic recording media have been known. It is admittedly known to include non-magnetic substrates with a layered stack of a magnetically soft under layer under non-magnetic interlayers and magnetically hard perpendicular recording layers (re: pages 2 ln 3 to 4 ln 11 and the prior art Fig. 1 of the instant specification). Applicants alleged advance is in the compositions of the interlayer and magnetically hard perpendicular recording layers to provide a negative nucleation field -  $H_n$  (sic) remanent <sup>2</sup> (square) (i.e. the magnetic force remaining in the element after recording magnetic force has been removed) equal to about 1, and high coercivity equal to about 5,000 Oe. Applicants accomplish this by selection of dimensions and materials for magnetically soft under layer under non-magnetic interlayers and magnetically hard perpendicular recording layers.

However the materials selected have been known in the art for perpendicular magnetic recording media and the selection of thickness are taught to be a matter of choice. This is demonstrated by the teachings of **Honda et al**.

In **Honda et al** see selection of materials:

- Substrate composition see col. 8 lns 15 - 25
- Interlayer composition of Ru in a bi-layer structure – note col. 3 lns 53-55, col. 6 ln 66- col. col. 7 ln 8, and thickness adjustments col. 7 lns 25-35, and 50-55, and col. 10 lns 67 – col. 11 ln 23 and col. 13 lns 25-33, and this is illustrated in Fig. 10 noting item 24.
- Soft magnetic under layer composition see Fig. 13 layer 49, col. 28 lns 41-45 and col. 44 lns 7 to 11 with a thickness changed to adjust for a desired coercivity - see col. 27 lns 2-13 and see col. 22 lns 15-22.
- Magnetically hard perpendicular layer composition see col. 22 lns 12-14, col. 16 lns 55-65, col. 17 lns 45-53, col. 21 lns 1-4 and col. 28 lns 2-5 for thickness selections see for example in Fig. 11 layer 41, and the effect of charges in alloying demonstrated through embodiments 1-6.
- Note effect of thickness variation of layers in the overall element in Figs 2, 3 and 6 and of alloying and stacking shown in Figs 4, and the magnetic field characteristics in Figs 8a and 8b.

Additionally **Futamoto et al** points out that density is controlled by a permutation of factors that go beyond materials to include the grain size as well as layer thickness of these materials - all of which would have been know to the worker having ordinary skill to routinely optimize in as series of technical trade offs in cost productivity, sensitivity and coercivity and the read back noise of the media.

In **Futamoto et al** note col. col. lns 15-31, col. 2 lns 24-37 and 44-55, col. 3 lns 43-45, col. 4 lns 44-55, col. 5 lns 26-37, col. 6 lns 39-46, col. 9 lns 22-26.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to adopt the perpendicular recording compositions of **Honda et al** in the admittedly conventional perpendicular recording media and make adjustments

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as to characteristic crystal sizes, alloy blends and layer thickness shown by **Futamoto et al** for the purpose of controlling the sensitivity and coercivity of the perpendicular recording media. One skilled in the art would have been motivated to adopt **Honda et al** to admissions of prior art in view of **Futamoto et al** with the expectation of raising the recording density of perpendicular recording media and decreasing read back noise (col. 1 lns 30-43 of **Honda et al** and col. lns 45-56 of **Futamoto et al**).

#### Other References

- Fullerton et al (US 6383598) is cited as being of interest showing the effect of chemical ordering on Kerr hysteresis.
- Ikeda et al (US 6468670) is cited as being of interest showing the effect of crystalline structure in perpendicular recording media.
- Kinuchi et al (US 5589262) is cited as being of interest showing perpendicular recording media and combinations of hard & soft magnetic layers.

#### CONCLUSION

The claims 1 to 13, 19 and 20 have been considered.

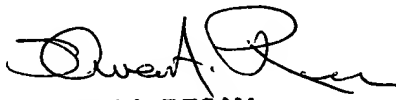
- No claim has been allowed.
- The Information Disclosure Statement has been received.

INQUIRES

Any inquiry concerning this communication from the examiner should be directed to examiner Louis Falasco, Ph.D. whose telephone number is 703.305-6974. The examiner can normally be reached M-F 9:30 AM - 6:00 PM.

- If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Paul Thibodeau may be reached at 703.308-2367.
- The Fax phone numbers for the organization where this application or proceeding is assigned are: 703.872-9310 for regular communications and 703.872-9311 for After Final communications.
- An inquiry of a general nature or relating to status of this application or proceeding should be directed to the TC 1700 receptionist whose telephone number is 703.308-0651.

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**STEVAN A. RESAN**  
**PRIMARY EXAMINER**